

Abstract

A novel hybridization device that improves the efficiency and consistency of microarray hybridization reactions by achieving a greater degree of internal mixing of target solution. The device provides a gasket-and-cover-type chamber wherein solution mixing is achieved by the creation of a multitude of microbubbles. One or more of the inner walls that define the chamber contain bubble-rupturing elements that extend into the chamber and terminate in sharp edges. They are typically located on opposite sides of a rectangular chamber and are pointed in a direction opposing bubble movement. Their interference with larger bubbles causes their breakup into microbubbles which travel separate and distinct paths as a result of external agitation and thereby provide improved solution mixing that results in a uniform distribution of target molecules to the probe molecules bound to the substrate. The sensitivity and consistency of the hybridization reaction is significantly increased.